

A SKETCH OF THE FLORA OF GUJARAT

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INTRODUCTION

This is a supplement to the earlier published information about the flora of Gujarat by Shah (1978)*.

FLORISTIC COMPOSITION

The wide variations in soil, climate and topography of Gujarat State have resulted in various types of forest growth ranging from moist deciduous to pure desert conditions. The major concentration of forests is found along the eastern border of the State and hilly portions of Saurashtra and some parts of north Gujarat. The plains are mostly devoid of forest cover.

The forests of Gujarat can be grouped into : (i) Tropical moist deciduous forests occur in the southernmost hilly portions of the State comprising Bulsar, Dangs and Surat districts. (ii) Dry deciduous forests-teak forests of Rajpipla, Chhotaudepur, Panchmahals, Sabarkantha district in north Gujarat and Junagadh and Amreli districts in Saurashtra and non-teak forests in some parts of Banaskantha district in north Gujarat and

Rajkot district in Saurashtra. (iii) Scrub forests occur in plain countries from Bulsar to Saurashtra and Kutch. (iv) Mangrove forests are found in coastal muddy creeks. Man made forests of *Casuarina equisetifolia* Forst. f. and *Prosopis juliflora* DC. are also found along coastal strips and many desert borders in Kutch.

Deciduous forests : Some of the common members in these forests are *Acacia chundra* Willd., *Adina cordifolia* Hk. f. ex Brand., *Anogeissus latifolia* Wall. ex Bedd., *Butea monosperma* Taub., *Diospyros melanoxylon* Roxb., *Holarrhena antidysenterica* Wall. ex Don, *Mitragyna parvifolia* Korth., *Tectona grandis* L. f., *Terminalia crenulata* Roth and *Wrightia tinctoria* R. Br. The large twiners like *Butea parviflora* Roxb., *Combretum ovalifolium* Roxb., *Dioscorea* sp., *Cissus repanda* Vahl, *Millettia racemosa* Bth., *Phanera integrifolia* Bth., *Pueraria tuberosa* Roxb., *Ventilago denticulata* Willd. and *Ziziphus rugosa* Lam. add denseness to the forest vegetation.

Scrub forests : The permanent vegetation is more often xerophytic with dominance of thorny species. Some typical members are *Acacia jacquemontii* Bth., *A. nilotica* subsp. *indica* Brenan, *A. planifrons* Koen., *A. senegal*

*Flora of Gujarat (under print by Sardar Patel University).

Willd., *Anogeissus sericea* Brand., *Balanites aegyptiaca* Del., *Capparis decidua* Edgew., *C. sepiaria* L., *Dichrostachys cinerea* W. & A., *Limonia acidissima* L., *Prosopis cineraria* Druce, *Zizyphus horrida* Roth and *Z. nummularia* W. & A.

Along road sides and railway lines *Anisomeles indica* O. Ktze., *Barleria prionitis* L., *Caesalpinia crista* L., *Capparis sepiaria* L., *Lantana camara* L. var. *aculeata* Mold., *Maytenus emarginata* D. Hou, etc. form natural hedges which support a number of climber and twiners, some of them conspicuous by their foliage, inflorescence or flower colour. A few worthy of mention are *Acacia torta* Craib, *Canavalia gladiata* Jacq., *Dalechampia scandens* L. var. *cordofana* Muell.-Arg., *Maerua oblongifolia* A. Rich. and *Mucuna prurita* Hk. f.

In the plains there are many permanent and temporary ponds and ditches which support a good aquatic flora. *Blyxa echinosperma* Hk. f., *Ceratophyllum demersum* L., *Hydrilla verticillata* Royle, *Vallisneria spiralis* L. etc. are submerged. Species of *Nymphaea*, *Nymphoides*, *Eichhornia crassipes* Solms, *Neptunia oleracea* Lour., *Pistia stratiotes* L. etc. are floating. In marshy places a number of species are found. To mention, some of them are species of *Ammannia*, *Commelinaceae*, *Compositae*, *Cruciferae*, *Cyperaceae*, *Elatinaceae*, *Heliotropium*, *Gramineae*, *Polygonaceae* and *Scrophulariaceae*.

Riparian flora : The river beds at some places are stony, rocky or pebbly and at times water-logged. Here *Crinum defixum* Ker-Gawl., *C. prattense* Herb., *Cryptocoryne retrospiralis* Kunth, *Rotula sepyllifolia* Bremek., *Rotula aquatica* Lour., *Saccharum spontaneum* L., *Tamarix ericoides* Rottl. etc. are common and abundant, but on rocks *Capillipedium hugelli* Camus, *Chrysopogon fulvus* Chiov., *Melanocenchris iacquemontii*

J. & S. and *Spodiopogon rhizophorous* Pilg. are frequent. Moist alluvium has the flora similar to that of marshes.

Along river banks, on hilly slopes and old walls a number of species occur but *Arthraxon lancifolius* Hochst., *Capparis cartilaginea* Decne., *Didymocarpus pygmaeus* Cl., *Eriophorum comosum* Wall. ex Nees, *Kickxia ramosissima* Janch., *Lindenbergia muraria* Bruehl, *Nepeta hindostana* Haines, *Pepromia pellucida* H. B. & K., *Sarcostemma acidum* Voigt, *Woodfordia fruticosa* Kurz are common often, occupying large areas.

Agrarian flora : It is similar to that in marshy places. It is quite rich during monsoon, after harvest, followed by plants typical of cold season. A few interesting plants are *Anagallis arvensis* L. var. *coerulea* Gren. & Godr., *Centaurium centaurioides* Rao & Hemadri, *Elytrophorus spicatus*, *Fuirena ciliaris*, *Hydrolea zeylanica* Vahl, *Lobelia alsinoides* Lam., *Polycarpon prostratum* Aschers. & Schweinf. and *Polygonum plebeium* R. Br.

Mangroves and flora of sea-shores and saline ground : *Avicennia marina* Vierh. and *A. officinalis* L., *Aegiceras corniculata* Blanco, *Bruguiera gymnorhiza* Lam., *Ceriops tagal* Roxb., *Rhizophora conjugata* L. and *R. mucronata* L. grow in sea-creeks. On mud flats *Aeluropus lagopoides* Trin. ex Thw., *Arthrocnemum indicum* Moq., *Artiplex stocksii* Boiss., *Cressa cretica* L., *Cyperus bulbosus* Vahl, *Lycium barbarum* L., *Peplidium martimum* (L. f.) Wettst., *Salicornia brachiata* Roxb., *Salvadora persica* L., *Salsola baryosma* Dandy, *Scirpus littoralis* var. *subulatus* Chiov., *S. tuberosus* Desf., *Sesuvium portulacastrum* L., *Suaeda fruticosa* Forsk. ex Gmel., *S. martima* Dum. and *S. nudiflora* Moq. are common, many of them in small or large, pure or mixed patches,

Sandy coasts are characterised by colonies of *Aeluropus lagopoides* Trin. ex Thw., *Cyperus arenarius* Retz., *C. conglomeratus* Rottb., *Indigofera cordifolia* Heyne ex Roth, *Launaea sarmentosa* Alst. and *Spinifex littoreus* Merr. Other plants, typical of the habitat, are *Arnebia hispidissima* DC., *Chlorophytum tuberosum* Baker, *Corbichonia decumbens* Exell, *Crotalaria notonii* W. & A., *Dactyloctenium indicum* Boiss., *Eleusine compressa* Aschers. & Schweinf., *Elyonurus royleanus* Nees ex Steud., *Eragrostis tremula* Hochst., *Fagonia cretica* L., *Farsetia jacquemontii* Hk. f. & Th., *Halopyrum mucronatum* Stapf, *Juncus bufonius* L., *Leptadenia pyrotechnica* Decne., *Limonium stocksii* O. Ktze., *Lotus garcinii* DC., *Pedalium murex* L., *Polycarpha spicata* W. & A., *Psilostachya sericea* Hk. f., *Seetzenia orientalis* Decne., *Sericostoma pauciflorum* Stocks ex Wt., *Tephrosia uniflora* Pers. subsp. *petrosa* Gillett, *Tribulus alatus* Del., *Urochondra setulosus* C. R. Hubb. and *Zygophyllum simplex* L.

GEOGRAPHIC DISTRIBUTION OF SPECIES

Distribution in the State : About 1650 wild species are reported from Gujarat. From a careful study of the geographical distribution of different species within the state a few interesting observations are made. (i) Some species are restricted only to one area/zone and the largest number of such species are found in Dangs in South Gujarat, followed by Saurashtra, Central Gujarat, North Gujarat and Kutch in order of number of such species. Of all the zones, the South Gujarat zone has the largest number of such species. (ii) Some species are found in two adjacent or distant zones. These data show restricted or discontinuous distribution of a number of species in Gujarat and therefore it becomes imperative for their more intensive search in many more

localities to bridge up the existing discontinuities in distribution.

It has been estimated that an approximate number of 312 species are restricted to only one area/zone, the largest number of such species (92) being in Dangs, followed by Saurashtra (66) and North Gujarat (37). 202 species are found in two adjacent or distant zones. The number of species common to adjacent zones of Kutch and Saurashtra is highest, followed by the next higher number in Central-South Gujarat zone. On the other hand in discontinuous zones, the number of such species is proportionately much less. The species found in Kutch are meagrely represented in north, central and south Gujarat zones but those from Saurashtra zone are relatively better represented in number in these zones and much better in south Gujarat zone.

Distribution in the world : It is observed that no species is endemic to Gujarat (except *Fuirena tuwensis* Desh. & Shah) though the highest number of species is Indian, with about 25% of it restricted to Western Peninsula and about 5% to states of Maharashtra and Gujarat. Species distributed in Malaysia, Africa, Ceylon, tropics in general also show relatively higher percentage in the composition of the flora of Gujarat. To this list also are added exotics and species distributed in tropical regions of the old world which also make up a sizable proportion.

SYNOPTIC DATA

Shah (1977) has described 1880 species belonging to 798 genera spread over 155 families. Of these 150 species are cultivated and, therefore, the wild species are 1650, which make up nearly 70% of the species listed by Cooke (*Fl. Pres. Bombay* Vols. I-III, 1958 reprinted).

The ten dominant families in order of the species number (when species number is equal, generic number is taken into account) are Leguminosae—including Papilionaceae, Caesalpiniaceae and Mimosaceae (258), Gramineae (229), Cyperaceae (112), Compositae (89), Acanthaceae (68), Euphorbiaceae (63), Malvaceae (53), Convolvulaceae (53), Labiatae (38), Scrophulariaceae (37), Cucurbitaceae (33) and Rubiaceae (30).

CONCLUSION

From the above data, it is clear that the flora of Gujarat is quite rich and its richness seems to be due to its topography and edaphic and climatic conditions. These conditions are certainly responsible for a diversity in forest types from tropical moist deciduous to desert conditions. However, the flora poses a challenge of discontinuous distribution of several species within the state, which can be met by more intensive explorations.